

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
19 May 2005 (19.05.2005)

PCT

(10) International Publication Number
WO 2005/045860 A1

(31) International Patent Classification⁷: **H01G 9/022**,
9/052, B22B 1/00, 1/02, 5/00, C01B 21/06

(74) Agent: **OHIE, Kunihisa**; Ohie Patent Office,
Selva-Ningyocho 6F, 14-6, Nihonbashi-Ningyocho
2-chome, Chuo-ku, Tokyo 103-0013 (JP).

(21) International Application Number:

PCT/JP2004/016918

(22) International Filing Date:

9 November 2004 (09.11.2004)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

2003-380066 10 November 2003 (10.11.2003) JP
60/520,636 18 November 2003 (18.11.2003) US

(71) Applicant (for all designated States except US): **SHOWA
DENKO K.K.** [JP/JP]; 13-9, Shiba Daimon 1-chome, Mi-
nato-ku, Tokyo 105-8518 (JP).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **OMORI, Kazuhiro**
[JP/JP]; c/o Corporate R & D Center, Showa Denko K.K.,
5-1, Okawacho, Kawasaki-ku, Kawasaki-shi, Kanagawa
210-0858 (JP). **AMITA, Hitoshi** [JP/JP]; c/o Corporate
R & D Center, Showa Denko K.K., 5-1, Okawacho,
Kawasaki-ku, Kawasaki-shi, Kanagawa 210-0858 (JP).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG,
KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG,
MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH,
PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN,
TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE,
SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: **NIOBium POWDER FOR CAPACITOR, NIOBIUM SINTERED BODY AND CAPACITOR**

(57) Abstract: The present invention relates to niobium powder for a capacitor, comprising a niobium layer and a mixed layer of silicon nitride and niobium, the mixed layer being present in the vicinity of the powder particle surface; granulated niobium powder thereof; a niobium sintered body using the niobium powder and the granulated powder; and a capacitor using the sintered body as one electrode. The niobium powder for a capacitor of the present invention enables to produce a niobium capacitor having a high capacitance, a low leakage current, a low ESR and good tan δ characteristics and being excellent particularly in the properties of the breakdown voltage and soldering heat resistance.

WO 2005/045860 A1